

Measuring CdA On-the-Road

Velocomp LLC

April, 2018

On-the-road CdA testing, August 2017

- Elite time trialist
- Athlete has previously been tested in a wind tunnel
 - Benchmark for “on the road” results
- No involvement from Velocomp except CdA beta firmware
 - Athlete purchased the test unit (Newton 5) from a local supplier
 - Athlete did his own set-up
 - Athlete selected the road
 - Athlete performed the tests
- Once the tests were completed, Velocomp was provided with ride files

Bike Tested

- Setup:
 - Falco TT bike
 - Wheels Flo 90 front, disc wheel rear
 - Tires 90PSI, Super Premium Vittoria Corsa Speed G+ TLR
 - Quarq DFPM



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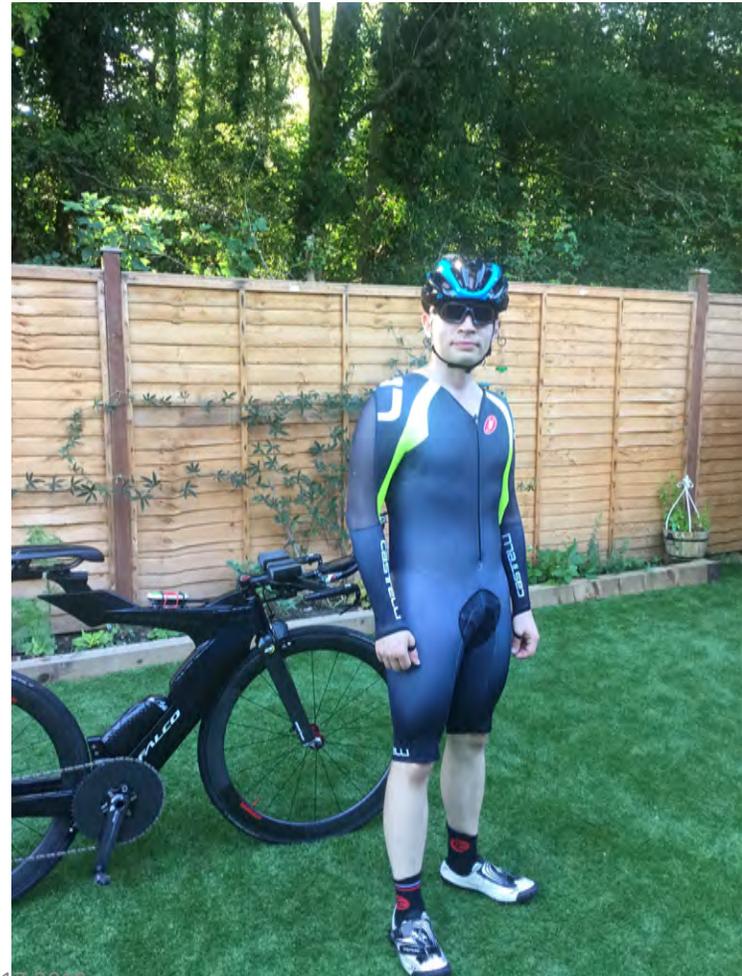
Four different tests, measuring effects of bike gear on CdA

- Run 1: Road bike outfit
 - Bioracer jersey/shorts
 - Giro Synthe helmet
 - Bont Vaypor shoes



Run 2

- Change clothing
 - Castelli BodyPaint 3.0



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Run 3

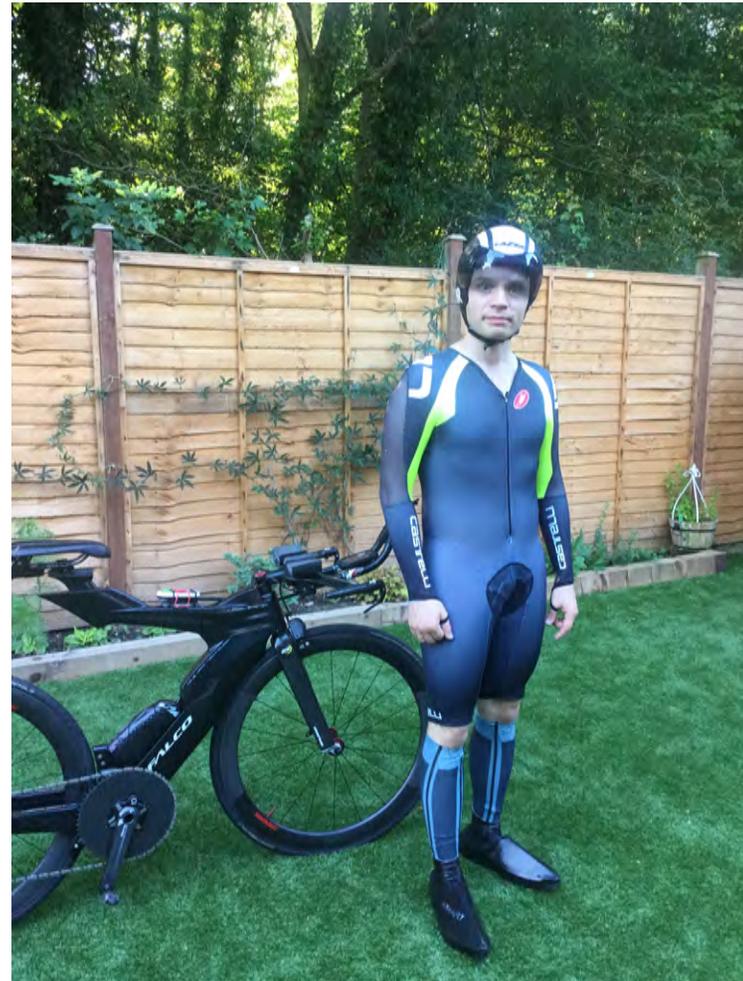
- Add:
 - Bont Crono shoes
 - Smart Overshoes
 - Nopinz Tripsocks



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Run 4

- Add:
 - Lazer Wasp helmet



Test Course: Countryside road



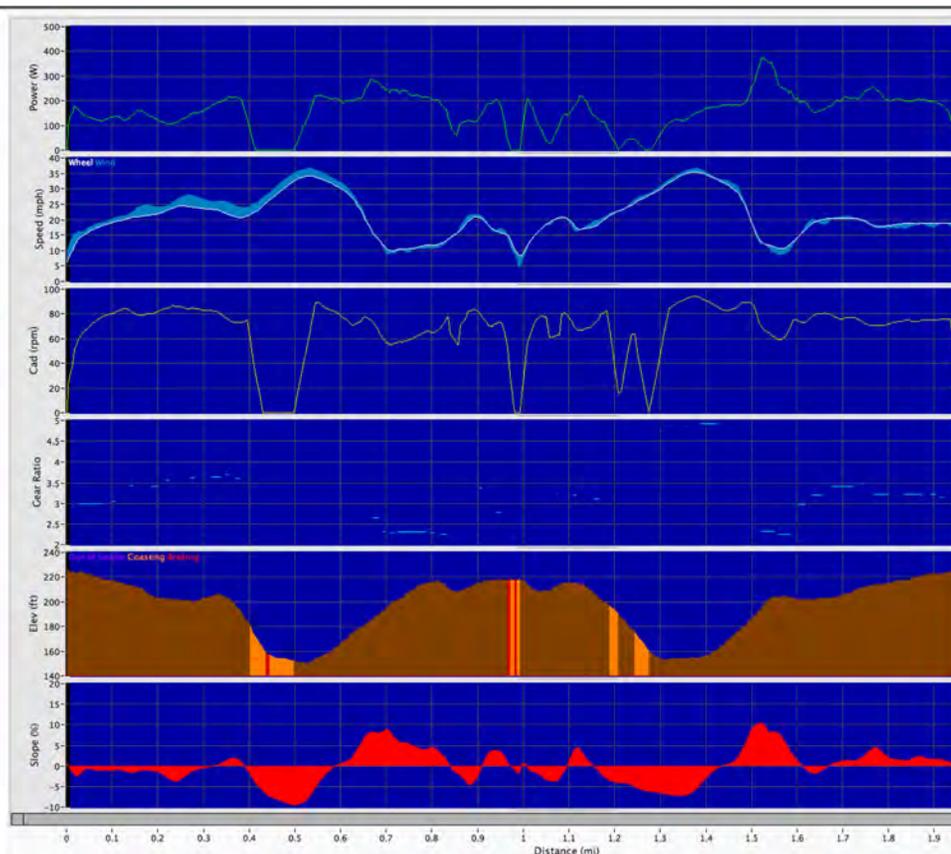
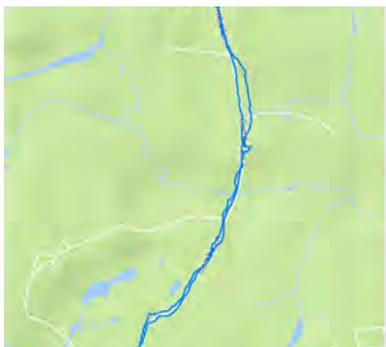
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Test Runs: 6 minutes per run, out-and-back, 1.2 miles

Ride: Run 1		Note
---Selection Stats---		
Distance:	1.94 mi (0:06:10)	
Energy:	61.4 kJ	
Calo Burn:	58.7 kcal	
Climbing:	148 ft	
Braking:	-3.0 kJ (-4.9%)	
	Min Avg Max	
SPM Pow	0 166.1 378 W	
Aero	0 112.4 559 W	
Rolling	10 24.0 45 W	
Gravity	-1386 -1.9 627 W	
Speed	7.9 18.9 35.4 mi/h	
Wind	0.0 19.3 37.4 mi/h	
Elev	150 201 326 ft	
Slope	-9.9 -0.03 16.7 %	
Cadence	29 73.7 95 rpm	
NP196N IP10.75 TDSi6 V1.1.18		
CDa: 0.223 m ² Crr: 0.0035		
192 lbs 8/22/17 5:46 PM		
62 degFr 1014 mbar		

View DPM 

Laps | Peaks | GPS



Results:

- Run 1 (road jersey) CdA = .223
- Run 2 (BodyPaint) CdA = .205
- Run 3 (add crono shoes, tripsocks) CdA = .181
- Run 4 (add Lazer Wasp helmet) CdA = .172

Wind tunnel vs Velocomp, Run 4

- Wind tunnel
 - $CdA = .179$
- Velocomp
 - $CdA = .172$



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Run 4: athlete's position was more aero for on-the-road test than wind tunnel test



On-the-road CdA = .172



Wind tunnel CdA = .179

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In the words of the athlete

- “To my mind, this is an excellent tool. One can aero test from baseline accurately, within touching distance of multi-thousand dollar systems.”